Factors impacting the formation of 3-MCPD esters and glycidyl esters during deep fat frying of chicken breast meat

ABSTRACT

The effect of the frying temperature, frying duration and the addition of NaCl on the formation of 3-monochloropropane-1,2-diol (3-MCPD) esters and glycidyl esters (GE) in palm olein after deep frying was examined in this study. The eight frying systems were deep-fat frying (at 160 and 180 °C) of chicken breast meat (CBM) (with 0, 1, 3 and 5% sodium chloride, NaCl) for 100 min/day for five consecutive days. All oil samples collected after each day were analyzed for 3-MCPD ester, GE, and free fatty acid (FFA) contents, specific extinctions at 232 and 268 nm (K 232 and K 268), p-anisidine value (pA), and fatty acid composition. There was a significant ($p < 0.05$) decrease in the 3-MCPD esters and a significant ($p < 0.05$) decrease in the GE with the increasing of the frying duration. There were significant ($p < 0.05$) increases in the 3-MCPD esters formed when the concentration of NaCl increased from 0 to 5%. The addition of NaCl to the CBM during deep frying had no significant effect on the GE generation. The FFA contents, K 232 and K 268 and pA showed that all the frying oils were within the safety limit.

Keyword: 3-monochloropropane-1,2-diol; Glycidyl esters; Palm olein; Frying